(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 April 2004 (29.04.2004)

PCT

(10) International Publication Number
WO 2004/036648 A2

MMD

(51) International Patent Classification[7]: H01L 23/498, G06K 19/077

(21) International Application Number: PCT/IB2003/004536

(22) International Filing Date: 15 October 2003 (15.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02292545.7 15 October 2002 (15.10.2002) EP
03290338.7 11 February 2003 (11.02.2003) EP

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(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

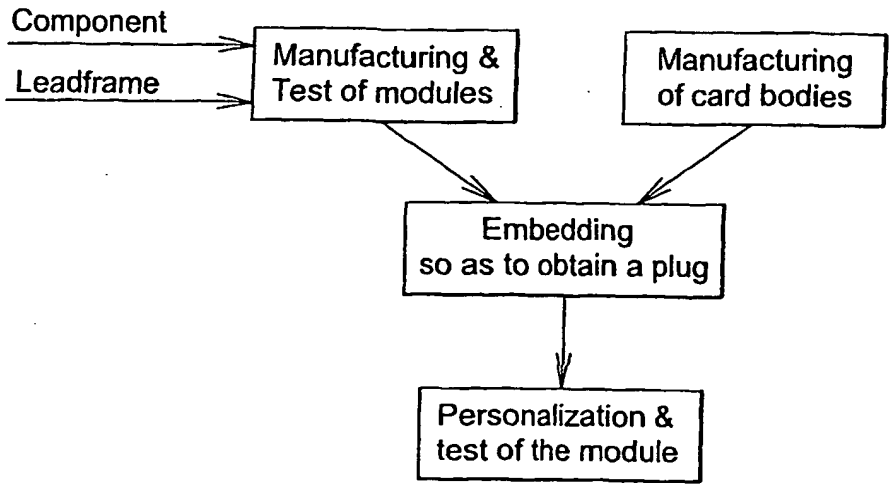
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv)) for US only*

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF MANUFACTURING A DATA CARRIER



(57) Abstract: The abstract concerns a support strip comprising roughly parallel gripping areas (10), the support strip comprising in addition a number of support elements (1a, 1b, 1c), a support element comprising conducting elements, a conducting element comprising a contact pad and a wiring pad, the support strip being characterised in that a support element (1a) is connected to a gripping area (10) using a snap-off junction area (11).

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Method of manufacturing a data carrier

Field of the invention

The invention concerns a method of manufacturing a data carrier provided with a microcircuit. The data carrier can be, for example, a plug that can be inserted in a cellular phone, said data carrier identifying the cellular phone user for accessing the telecommunication network. The plug can be, for example, a GSM plug respecting the GSM 11.11 standard (2G plug) or the third generation project (3G plug). The GSM plug is also known as a Subscriber Identity Module card (SIM card). The invention also concerns a support strip comprising substantially parallel gripping areas.

Background of the invention

Figure 1 illustrates a method of manufacturing a plug that can be used in a cellular phone. Such a plug comprises a card body and a module. A module comprises a microcircuit and protective resin. The module is generally manufactured independently of the card body and tested separately. If the test is satisfactory, the module is embedded in the card body of an ISO card. The card body is then pre-cut in the format of a GSM plug. In a second testing step, the microcircuit is then tested again. This second test can also be carried out after the embedding but before the cutting. An ISO card provided with a pre-cut outline in the format of the plug is thus obtained. Before use, the plug is separated from the ISO card by the end user. Thus the GSM plugs are manufactured in a discontinuous manner.

Summary of the invention

An object of the invention is to reduce the cost

According to one aspect of the invention, a method of manufacturing a plurality of data carriers from a support strip, a data carrier comprising a data carrier body provided with a microcircuit, the support strip comprising a plurality of support elements, a support element comprising wiring pads, comprises the following steps:

- an overmoulding step, in which the support elements of the support strip are overmoulded so as to obtain a plurality of data carrier bodies,
- a microcircuit-connecting step, in which microcircuits are electrically connected to the wiring pads of the data carrier bodies so as to obtain a plurality of data carriers.

The data carrier can be, for example, a GSM plug. Thanks to the invention, a GSM plug can be directly obtained without having to manufacture a pre-cut ISO card. Less plastic material is required. In addition only one testing step is needed and only one support strip is handled during the manufacturing. The invention thus allows reducing the costs.

Brief description of the drawings

Figure 1 is a diagram illustrating a known method of manufacturing a plug that can be used in a cellular phone;

Figure 2 shows a cross-section view and top view of a data carrier;

Figure 3 illustrates a method of manufacturing a plurality of GSM plugs; and

Figure 4 illustrates a GSM plug arranged to be inserted in an ISO card.

Detailed description

Figure 2 illustrates a GSM plug comprising a card body provided with a microcircuit. The card body comprises a first side and a second side. A cut metal grid (1) is embedded in the card body. The cut metal grid comprises contact pads (2), wiring pads (3) and handling areas (indexing holes,

support, etc.). The contact pads are flush with the first side. The card body is advantageously made of a thermoplastic (4) material. The GSM plug further comprises a support for the metal grid (1), reference edges (5) of the plug, 2G (6b) and 3G (6a) foolproofing areas and a cavity (7) arranged to receive the microcircuit and mark out the coating. The cavity (7) is advantageously placed on the first side so that the second side can easily be graphically personalized. Such a plug is described in the international patent application WO 0245010 which is hereby incorporated by reference.

Figure 3 illustrates a method of manufacturing a plurality of GSM plugs. The method consists of using a support strip. The support strip comprises indexing and foolproofing holes (9), gripping areas for support or clamping by handling systems (10) and snap-off junction areas (11). The support strip further comprises several metal grids (1a,1b, 1c). A metal grid (1a) comprises contact pads (2), wiring pads (3), handling areas (indexing holes, support, etc.). The snap-off junction areas (11) are used to join a metal grid (1a) to the gripping areas (10) of the support strip.

In an overmoulding step, the various metal grids (1 a,1b, 1c) of the support strip are overmoulded, so as to obtain a plurality of card bodies. Overmoulding can be carried out using, for example, a thermoplastic material.

In a microcircuit-inserting step, microcircuits are inserted in the cavities (7) of the card bodies. The microcircuits are then electrically connected to the wiring pads (3) and coated with a protective resin so as to obtain GSM plugs.

In a test and personalisation step, the card bodies are graphically personalised. The microcircuits are tested and personalised in this step.

In a cutting step, the GSM plugs are cut to separate them from the rest of the support.

Thus the GSM plug are manufactured in a continuous manner.

The description hereinbefore illustrates a method of manufacturing a plurality of data carriers from a support strip, a data carrier comprising a data carrier body provided with a microcircuit, the support strip comprising a plurality of support elements (1), a support element comprising wiring pads, that comprises the following steps:

- an overmoulding step, in which the support elements of the support strip are overmoulded so as to obtain a plurality of data carrier bodies ; and
- a microcircuit-connecting step, in which microcircuits are electrically connected to the wiring pads (3) of the data carrier bodies so as to obtain a plurality of data carriers.

According to another aspect of the invention, the support strip comprises roughly parallel gripping areas (10). The support strip comprises a plurality of support elements (1). A support element comprises conducting elements. A conducting element comprises a contact pad and a wiring pad. The support element (1) is connected to a gripping area (10) using a snap-off junction area (11).

The data carrier element was a GSM plug. More generally, the data carrier element can be any data carrier comprising a body that can be moulded, for example, a plastic body.

The support elements are, for example, metal grids (1a,1b, 1c). More generally, the support elements can be made from any material that is stiff enough to be overmoulded without being damaged.

The elements 9, 10 and 11 of the support strip can be made from metal or any other material stiff enough to allow good gripping. For example a plastic material could be used.

Alternatively, during the overmoulding step, various shapes can be obtained. Handling areas used for possible individual handling of a single data carrier can be overmoulded. The handling areas can be, for example, notches and/or holes used, for example, in alignment, orientation.

As illustrated in figure 4, the metal grid can be overmoulded in such a manner that the thus obtained GSM plug can be inserted in a receiving card. In this respect, for example, a clipping element can be moulded in the GSM plug body.

As illustrated in figure 2, a 3G plug can also be directly integrated with the body of the 2G plug by adding a moulded snap-off area (8). The moulded snap-off area thus defines a main area (MA) and an auxiliary area (AA). Advantageously, the part of the metal grid corresponding to the auxiliary area (AA) can also be arranged to receive an electronic component such as, for example, a memory component, in particular a flash memory. The memory component can be connected to the microcircuit using, for example, a DSI bus. The electronic component can also be a crypto-processor or any other electronic component.

Advantageously, and preferably just before the microcircuit-inserting step, a printing step can be introduced, in which the various card bodies are printed.

Claims

1. A method of manufacturing a plurality of data carriers from a support strip, a data carrier comprising a data carrier body provided with a microcircuit, the support strip comprising a plurality of support elements (1a, 1b, 1c), a support element comprising wiring pads, the method comprising the following steps:
   - an overmoulding step, in which the support elements of the support strip are overmoulded so as to obtain a plurality of data carrier bodies ; and
   - a microcircuit-connecting step, in which microcircuits are electrically connected to the wiring pads (3) of the data carrier bodies so as to obtain a plurality of data carriers.

2. The method according to claim 1, wherein the method further comprises a cutting step, in which the data carriers are cut out.

3. A support strip comprising roughly parallel gripping areas (10), the support strip comprising in addition a number of support elements (1a, 1b, 1c), a support element comprising conducting elements, a conducting element comprising a contact pad and a wiring pad, the support strip being characterised in that a support element (1a) is connected to a gripping area (10) using a snap-off junction area (11).

4. The support strip according to claim 3, characterised in that the support element (1a) is a support grid.

5. The support strip according to claim 3, characterised in that the support element (1a) comprises a foolproofing edge (6a).

6. The support strip according to claim 4, characterised in that the support element (1a) comprises a second foolproofing edge (6b).

7. The support strip according to claim 3, characterised in that the support element (1a) is metallic.

8. The support strip according to claim 4, characterised in that the support element (1a) has a contour whose geometry substantially complies with standard GSM 11.11.

9. The support strip according to claim 3, wherein the support element is arranged to receive an electronic component.

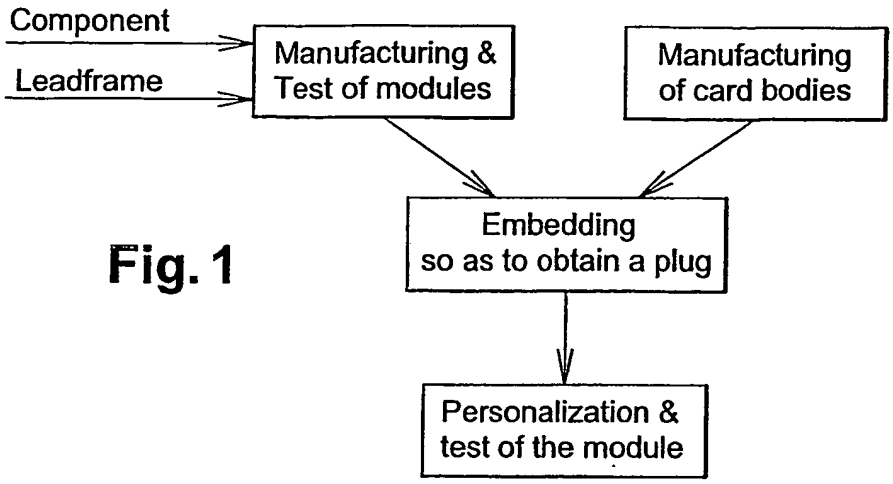
Component
Leadframe
Manufacturing & Test of modules
Manufacturing of card bodies
Embedding so as to obtain a plug
Personalization & test of the module

Fig. 1

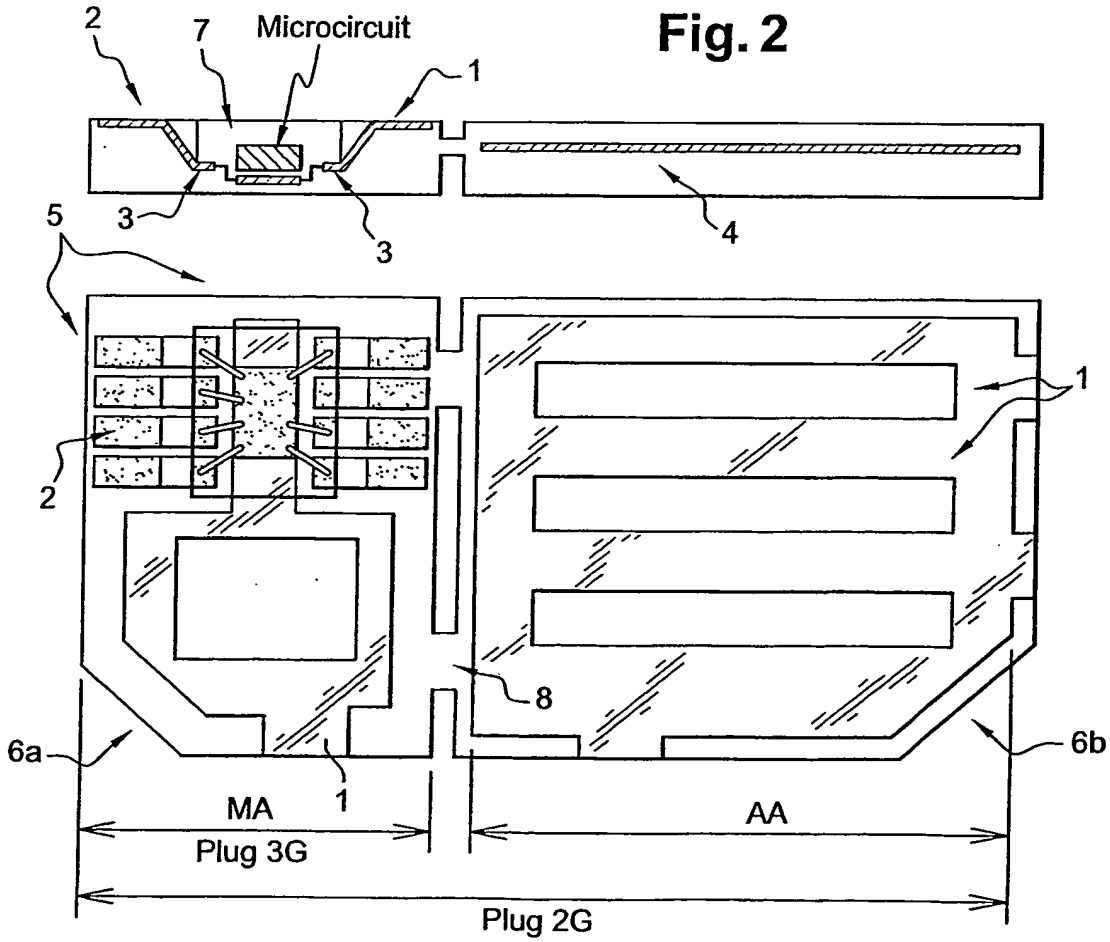
2
7
Microcircuit
1
3
3
4
5
2
1
8
6a
6b
1
MA
AA
Plug 3G
Plug 2G

Fig. 2

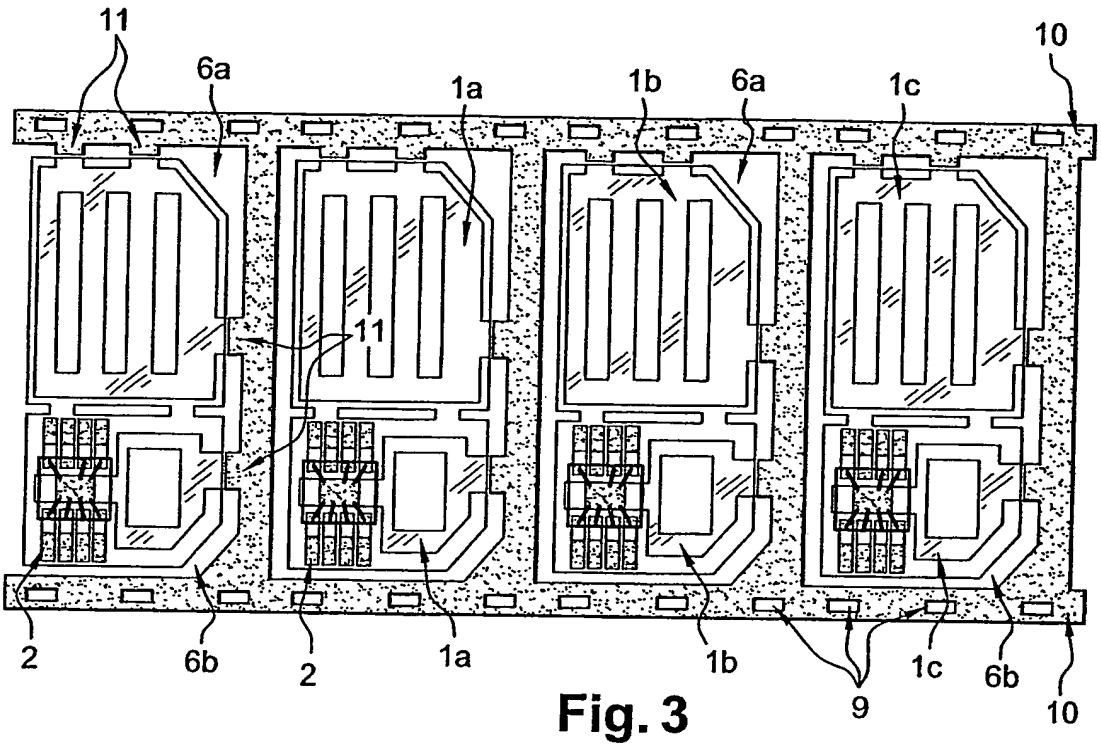

Fig. 3

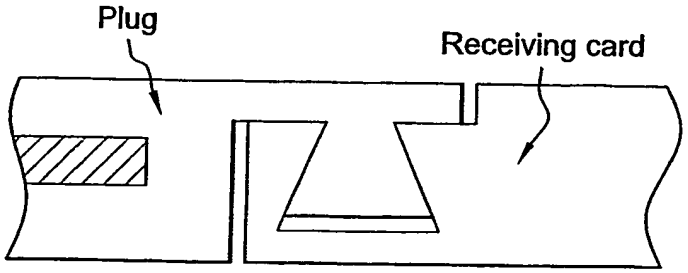

Fig. 4